

Xinyu Luo

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Education

Ph.D., Computer Science, Purdue University, USA 05 / 2026
M.S., Computer Science, New York University, USA 05 / 2021
GPA: 3.88/4.0
B. Eng, Software Engineering, Harbin Engineering University, China 07 / 2018
GPA: 91.07/100 **Ranking:** top 3% among 108 students
Non-degree, Courant Institute of Mathematical Sciences, New York University, USA 05 / 2022
GPA: 3.83 **Credit:** 6

Research

Research Intern for Prof. Christopher Musco at New York University 12 / 2020 – present

Project I: Dimensionality Reduction for Kernel Density Estimate (KDE)

- Designed and analyzed dimensionality reduction algorithms for non-parametric statistics.
- Extended a previous dimensionality reduction algorithm for KDE mode finding in high dimensions from the Gaussian kernel to a much broader class of kernels, and showed effectiveness by experiments.
- Proved NP-hardness of the mode finding problem for specific non-smooth kernels of the KDE problem.
- Paper under preparation (see Publication section).

Project II: Hardness Analysis for Mode Finding of Gaussian Kernel Density Estimation

- Analyzed the hardness of Gaussian KDE mode finding under the strong exponential time hypothesis (SETH) by reducing to a Gap Max Cover problem.
- Performed experiments for validating the reduction.

Research Assistant for Prof. Li Zhu at Xi'an Jiaotong University (XJTU) 08 / 2018 – 04 / 2019

Project: Point Cloud Multi-View Registration Methods for 3-D Scanning System (National Funding)

- Managed database and conducted data processing.

Projects

Advanced Project Advised by Prof. Greg Aloupis at New York University 02 / 2020 – 08 / 2020

Project: A Survey of the Theta Graphs

- Analyzed and summarized sweeping line algorithm for building a Theta Graph in 2-dimensions.
- Surveyed different upper bounds, performed experimental verification of state-of-the-art theoretical bounds by randomization.

Project extension: Graph Generator for Theta Graph

- Used a reinforcement learning method to generate graphs based on an autoregressive model.

Course Project Advised by Prof. Julian Togelius at New York University 02 / 2020 – 05 / 2020

Project: Generalization of Reinforcement Learning with ProcGen

- Used Gym (OpenAI) as a training environment and created AI agents between different game levels.
- Compared performance among evolution strategies used attention mechanism and selective noise injection. Combined those algorithms for a better performance.

Publications

Xinyu Luo, Christopher Musco, Cas Widdershoven, "Dimensionality Reduction for Mode Finding in General Mixture Models". *Paper under preparation, will be released soon.*

Xinyu Luo, Naichao Hu, Lulu Sui, Xia Wang, "Function of Wildlife Conservational Education and Prospect of Computer Technique", *Chinese Journal of Wildlife*, vol. 38, pp. 103-109, Feb 2017.

Teaching Assistant

NYU CS-GY 6703 Computational Geometry **01 / 2021 – 05 / 2021**

Instructor: Boris Aronov

- Graded homework.

NYU CS-GY 6033 Design and Analysis of Algorithms **09 / 2020 – 12 / 2020**

Instructor: Erin McLeish

- Held weekly office hours, and graded homework.

Internships

IBM, back-end developer, DB2 level 2 team **09 / 2017 – 07 / 2018**

Project: ZServerAdvisor Based on Cloud Computing Environment

- Optimized an algorithm for fetching large amount of data from a third-party server and extracted useful data to update the system DB within a limited time. Solved account blocking problems caused by a limitation of the third-party server.
- Improved the I/O speed by changing the data storage structure using NodeJS; Designed a multithread function with a divide-and-conquer strategy using Redis.
- Resulted in a 15-fold reduction in running time.

Huawei Technologies Co., Ltd., back-end developer, SDN Division **07 / 2017 – 09 / 2017**

Projects: V3 WAN Controller & U2000IP

- Conducted Git and Ruby script analysis; Wrote Java and Angular programs for the V3 WAN Controller.
- Main React and NodeJS developer for the U2000IP project; successfully passed the first stage of testing and received a certification from Huawei.

Honors

Merit Scholarship of NYU **2019 – 2021**

First Prize Scholarship (all terms apart from the 6th term) of HEU **2014 – 2018**

Honorable Medal, ACM International Collegiate Programming Contest - Asian Region **10 / 2016**

Bronze Medal, 10th Northeast Regional Collegiate Programming Contest. **09 / 2016**

Third Place, 11th Heilongjiang Province Collegiate Programming Contest. **05 / 2016**

Activities

- Member of Algorithm and Foundation Group at NYU Tandon School of Engineering **2020 – present**
- Create a homework problem for course Algorithmic Machine Learning and Data Science. **09 / 2021**
- 2-hour reading group presentation, 2 times. **10 / 2020**
- ACM-ICPC team member of Harbin Engineering University. **2015 – 2018**

Technical Skills

Skills: Algorithm, Data Structure, Database, Data Science, Machine Learning, Deep Learning

Languages: C++ (5 years), Python (3 years), SQL (2 years), Java (2 years), C, JavaScript

Frames & Tools: NodeJS, Redis, Pytorch, Android